CONTAINER FOR TRANSPORTING, STORING AND DISPENSING CHEMICAL PRODUCTS

This is a continuing application of U.S. Ser. No. 08/258,742, filed Jun. 10, 1994, now abandoned.

BACKGROUND OF THE INVENTION

The subject of the present invention is a container for transporting, storing and dispensing chemical products, particularly chemical products with a very high degree of purity such as those intended for the semiconductor industry.

Containers have recently been developed which are compatible with this use and which include an inner shell made of fluoroplastic, particularly PFA (perfluoroalkoxy copolymer), fitted at its upper part with a stopper device traversed by filling and dispensing connections, and an outer shell exhibiting a substantially cylindrical outer shape and an inner shape substantially matching that of the inner shell.

An example of such a container is indicated in FR-A-2,628,074.

In the container according to this prior document, the outer shell, which is preferably a double-walled shell made of polyethylene lined with a foam, is cylindrical over the entire height of the container.

Such a design makes the container relatively sensitive to lateral impacts, particularly during transportation and during use, particularly at the lower part of the container via which the latter is made to knock against the ground or the surfaces of means of transport. The nature of such impacts is such as to damage the inner shell and/or the connections with which the stopper device of the latter is fitted.

SUMMARY OF THE INVENTION

The present invention proposes to produce a container for transporting, storing and dispensing chemical products, which can be pressurized and demounted and which affords optimum resistance to impacts, particularly at the top part and bottom part of the container, which impacts might lead to deterioration of the inner shell and/or of the connections of the stopper device.

According to a first characteristic of the present invention, the outer shell includes a cylindrical part which, at its lower part, is integral with a base of quadrilateral cross-section and of greater cross-sectional area than that of the cylindrical part of the outer shell.

This base, which is square or preferably rectangular and which may be fitted with feet at its lower part, affords the container excellent stability on the ground, the parts overhanging the base constituting a shield for protection against impacts.

The base also constitutes a transport pallet, the container thus constituting a structure which can be transported in one piece.

According to another characteristic of the present invention, the outer shell is surmounted by an annular lid for the peripheral protection of the connections with which the stopper device is fitted, the said lid being made up of a plurality of bosses separated from each other by slits with a bottom wall inclined downwards and outwards. The lid advantageously exhibits a frustoconical overall shape, the bosses being segments of a cone frustum.

The segments constituting the lid which are located around the central part of the container from which the connections of the stopper device extend upwards, exhibit a height greater than that of the connections and constitute, in the corresponding zone, a shield against lateral impacts to which the container might be subjected and which might damage the connections projecting from the stopper device.

The slits produced between the segments of the lid facilitate access to the connections by the users, it being possible for the latter to insert their arm right up to the stopper device equipped with the connections without being hindered by the height of the lid.

The outwardly sloping slits also promote the runoff of water after the outer shell of the container has been cleaned with water jets before use. The passages thus produced prevent the water from stagnating on the upper part of the container.

The specific shape of the lid according to the present invention also avoids disturbance of the vertical laminar flow of clean air used when connecting the container.

The laminar flow can run off from the top of the connections towards the base of the latter and be removed without a high degree of turbulance, via the slits formed between the segments of the lid.

According to another characteristic of the present invention, in order to afford, even in the event of impacts, particularly satisfactory sealing of the stopper device at the upper end of the inner shell, the stopper device is fixed to a collar provided at the upper part of the inner shell by fixing members, such as studs made of composite materials, and exhibits a frustoconical lower extension capable of being housed in the said collar which for this purpose includes an inner wall of corresponding frustoconical shape.

This embodiment makes it possible to dispense with any elastomer seal between the stopper device and the inner shell which, in conventional containers, is a source of pollution for the products transported because it does not exhibit the chemically inert characteristics of fluoroplastics, in particular, pure PFA used to produce the inner shell and that part of the stopper device which is intended to penetrate into the inner shell.

According to another characteristic of the present invention, the inner shell made of PFA by rotomoulding, or rolling or thermoforming then welding of sheets of PFA, is reinforced with composite materials, for example polyester and glass fibres, making it possible to produce an inner shell which is resistant to pressure.

The inner shell preferably exhibits domed upper and lower parts joined together by a cylindrical part, this cylindrical part being located at a certain distance internally from the inner wall of the outer shell.

In order to assemble the container, fixing members made of composite, non-metallic, materials are used, such as the studs already mentioned above for assembling the stopper device on the collar of the inner shell and screws for fixing the lid on the one hand to the inner shell and on the other hand to the outer shell.

The container is thus entirely demountable so that, after removal of the lid and of a dust cap which is generally provided above the stopper device, the inner shell may easily be extracted from the outer shell and, if need be, replaced.

BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of making the invention easier to understand, one embodiment thereof will now be described by way of non-limiting example, with reference to the appended drawing in which:

FIG. 1 illustrates a container according to the invention in the assembled position,